

DA 3.2 *Data Access Services Functional Requirements*

DA 3.2.1 Data Management Requirements

DA 3.2.1.1 File Access Requirements

The File Access function provides a capability to develop COE infrastructure and mission applications which are file system independent and portable across DII COE approved hardware platforms. The File Access function is low level in nature and provides a layer which buffers COE infrastructure and mission applications from the operating system. The File Access function provides security mechanisms to prevent the unauthorized access to classified or sensitive information contained within file system files. Figure 1. File Access Function Layer shows a Mission Application which utilizes these services.

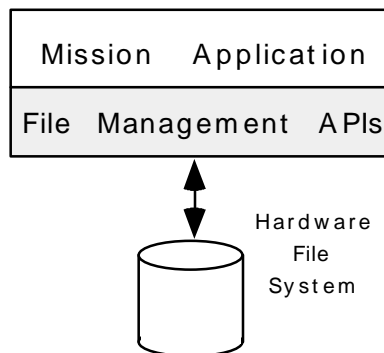


Figure 1. File Access Function Layer

DA 3.2.1.1.1 Cross Platform Portability

DA 3.2.1.1.1.1 The DMS shall be able to work with files which range in size from 0 bytes to the largest file size supported across all DII COE approved platforms. Four gigabytes is the largest file size portable across all DII COE approved platforms.

Traceability: FMWG
Related Requirement is 3.2.1.1.1.2
Priority 1

DA 3.2.1.1.1.2 The DMS shall support 32 bit file access formats. The 32 bit file format is standard across all DII COE approved platforms.

Traceability: FMWG
Priority 1

DA 3.2.1.1.1.3 The DMS shall be able to read and write variable size file blocks. The default block size varies from operating system to operating system. The DMS shall allow parameters to define the block size.

Traceability: FMWG
Priority 1

DA 3.2.1.1.1.4 The DMS shall provide a cross-platform file structure which will allow machines of different architectures and capabilities to determine the file's characteristics. Table 1. Cross Platform File Structure summarizes each of the attributes contained within the cross-platform file structure.

Traceability: FMWG / DISA
Priority 2

Component	Description
handle	Handle to the file
memory	Memory block containing the file name and path
type	The file type
error	The most recent error condition
bytes	The number of bytes actually read or written, only valid immediately after a read or write operation
attributes	Attributes assigned to the file, for example read-only or hidden. File access options, for example truncate/append or text/binary. The file creator, which application created the file.

Table 1. Cross Platform File Structure

DA 3.2.1.1.1.5 The DMS shall support big-endian (byte 0 is the most significant) and little-endian (byte 0 is the least significant) byte swapping. Various machines have different architectures which store data differently. The File Management Services shall provide the ability to specify a parameter which will order the Most Significant Bit(MSB) .

Traceability: FMWG
Priority 2

DA 3.2.1.1.1.6 The DMS shall provide support for maintaining alphanumeric case sensitivity of file name. The POSIX Operating System maintains case sensitivity.

Traceability: FMWG
Priority 1

DA 3.2.1.1.2 Functional Capabilities

DA 3.2.1.1.2.1 The DMS shall support the subset of file management functions which exist across the DII COE approved system standards and platforms. These functions shall work with both local and remote files. Table 2. File Access Functional Cross Reference lists functions cross referenced against POSIX and Windows Operating Systems.

Traceability: FMWG
Priority 2

Function	POSIX	Windows 95	Win32
create	creat()	CreateFile	CreateFile or _lcreate
delete	unlink()	DeleteFile	DeleteFile
rename	rename()	MoveFile	MoveFile
file size	stat()	GetFileSize	GetFileSize
get attributes	stat()	GetFileAttributes	GetFileAttributes
set attributes	fcntl()	SetFileAttributes	SetFileAttributes
open	open()	CreateFile OpenFile	CreateFile OpenFile _lopen
close	close()	CloseHandle	CloseHandle _close

read	read()	ReadFile	ReadFile _lread _hread
write	write()	WriteFile	WriteFile _lwrite _hwrite
open file dialog		GetOpenFileNam	GetOpenFileName
save file dialog		GetSaveFileName	GetSaveFileName

Table 2. File Access Functional Cross Reference

DA 3.2.1.1.2.2 The DMS shall provide a capability to simultaneously access files in read-only mode.

Traceability: FMWG

Priority 1

DA 3.2.1.1.2.3 The DMS shall provide the capability to create and access files with read, write and execute parameter associations.

Traceability: FMWG

Priority 1

DA 3.2.1.1.2.4 The DMS shall provide auditing mechanisms for tracking the time and identity of the user or application which is accessing a file. This data will be written to the DII COE audit file. This capability should be able to be enabled or disabled utilizing security administration tools. (Cross reference with the Security Administration SRS).

Traceability: SWG

Priority 2

DA 3.2.1.1.3 File System Formats

The DMS uses the File Access functions described above in the Functional Capabilities Section. These functions can be applied utilizing multiple disk file formats. These formats are described in the requirements listed below and provide DII COE the broad spectrum of file types necessary to produce a functional system.

DA 3.2.1.1.3.1 The DMS shall have the capability to read and write text files. Text files are human readable files based upon the standard and extended ASCII character set.

Traceability: FMWG

Priority 1

DA 3.2.1.1.3.2 The DMS shall have the capability to use binary files. A binary file is one that is in a specific application format or is directly machine readable. They typically cannot be directly read by humans. There are some specific forms of binary file which are pertinent to DII COE. These binary file types are: Compressed files, Encrypted Files, and Library Files.

Traceability: FMWG

Priority 1

DA 3.2.1.1.3.3 The DMS shall have the capability to compress files using DII COE-approved compression algorithms. Compressed files are used to save space when not in use or to reduce file size for file transfer and storage. The DMS must uncompress a file prior to the retrieval of data.

Traceability: FMWG

Priority 2

DA 3.2.1.1.3.4 The DMS shall have the capability to encrypt files using the DES encryption or other specified algorithm. Encrypted files are files which have been encoded with a security key to

prevent unwarranted access to the contents of the file. (Cross reference with the Security Administration SRS).

Traceability: FMWG
Priority 2

DA 3.2.1.1.3.5 The DMS shall have the capability to create and utilize library files. Libraries provide an efficient method for storing and maintaining different types and amounts of data.

Traceability: FMWG
Priority 3

DA 3.2.1.1.4 File Feature Specification

DA 3.2.1.1.4.1 The DMS shall support standard file feature specifications. These specifications listed in Table 3. Common File Formats provide an easy cross reference for determining common file formats.

Traceability: FMWG
Priority 2

File Feature	POSIX	Windows 95	Windows NT	Common Format
name	255 A-Z a-z._- characters	255 Unicode characters	255 Unicode characters	255 A-Z a-z._- characters
directory	255 A-Z a-z._- characters	255 Unicode characters	255 Unicode characters	255 A-Z a-z._- characters
volume	none	1 character A-Z	1 character A-Z	none
path	Parameter (e.g. 1024)	arbitrary	arbitrary	Parameter

Table 3. Common File Formats

DA 3.2.1.1.4.2 The DMS shall provide support for using valid characters and separators for file names. Table 4. Valid Characters and Separators depicts each file feature and the valid values.

Traceability: FMWG
Priority 2

File Feature	POSIX	Windows 95	Windows NT	Common Format
case sensitivity	case is maintained	all characters converted to upper case	case is maintained	case is maintained
valid separators	/ for path	: for volume / for path	: for volume / for path	/ for path
disk volume identifiers	none	A through Z	A through Z	none
invalid name characters		*?/\+.,SPACE"; <>={}	:*?<> "	*?/\+.,SPACE"; <>={}

Table 4. Valid Characters and Separators

DA 3.2.1.1.5 Directory Services

The DMS provides directory services. Directory services provide a mechanism for applications to search, traverse, or query a directory tree. Directory services provide the capability to access both local and remote files systems. Directory services functionality is described in the requirements below.

- DA 3.2.1.1.5.1 The DMS shall provide the capability to get directory information.
Traceability: FMWG
Priority 1
- DA 3.2.1.1.5.2 The DMS shall provide support for hidden files.
Traceability: FMWG
Related Requirement is 3.2.1.1.5.1
Priority 2
- DA 3.2.1.1.5.3 The DMS shall provide the capability to get the current directory.
Traceability: FMWG
Related Requirement is 3.2.1.1.5.3
Priority 1
- DA 3.2.1.1.5.4 The DMS shall provide the capability to traverse the directory tree.
Traceability: FMWG
Related Requirement is 3.2.1.1.5.1
Priority 1
- DA 3.2.1.1.5.5 The DMS shall provide the capability to get a list of files in a directory.
Traceability: FMWG
Related Requirement is 3.2.1.1.5.7
Priority 1
- DA 3.2.1.1.5.6 The DMS shall provide the capability to access data files identified by logical, not physical, file names.
Traceability: ARMY
Priority 1
- DA 3.2.1.1.5.7 The DMS shall provide the capability to access local and remote data files.
Traceability: ARMY
Priority 1

DA 3.2.1.2 Database Access Requirements

The DMS Database Access function consists of the following major capabilities:

- Database Services
- Application Generation
- Distributed Database Services
- Data Dictionary Services

The DMS Database Access function encapsulates the capabilities, services, and functionality to be implemented. It provides capabilities supported by COTS products within a client-server relational database environment. These basic services will be accessed by the application using public Application Programming Interfaces (APIs). This technique will ensure the applications a means of decoupling from the vendor unique implementations of their COTS database management products.

DA 3.2.1.2.1 Database Management Services Capabilities

- 3.2.1.2.1.1 The DMS shall process ANSI standard SQL as specified in FIPS PUB 127-2.
Traceability: DBWG
Priority 1
- 3.2.1.2.1.2 The DMS shall support processing of SQL statements embedded in an application program.
Traceability: ACCS-A1-100-006
Priority 1

3.2.1.2.1.3 The DMS shall provide the capability to create named sequences of SQL statements at the request of an application program.

Traceability: AGCCS
Priority 1

3.2.1.2.1.4 The DMS shall provide the capability to modify named sequences of SQL statements at the request of an application program.

Traceability: AGCCS
Priority 1

3.2.1.2.1.5 The DMS shall provide the capability to save named sequences of SQL statements at the request of an application program.

Traceability: AGCCS
Priority 1

3.2.1.2.1.6 The DMS shall provide the capability to execute named sequences of SQL statements at the request of an application program.

Traceability: AGCCS
Related Requirement is 3.2.1.2.1.3
Priority 1

3.2.1.2.1.7 The DMS shall provide the capability to delete named sequences of SQL statements at the request of an application program.

Traceability: AGCCS
Priority 1

3.2.1.2.1.8 The DMS shall provide the capability to optimize SQL statements.

Traceability: ACCS-A1-100-006
Priority 1

3.2.1.2.1.9 The DMS shall provide the capability to commit (two-phased) database transactions.

Traceability: ACCS-A1-100-006
Priority 1

3.2.1.2.1.10 The DMS shall enable mission applications, as well as other COE components, to use stored procedures.

Traceability: DBWG
Priority 1

3.2.1.2.1.11 The DMS shall support the notification of applications when a database transaction cannot be performed.

Traceability: JOPES
Priority 1

3.2.1.2.1.12 The DMS shall provide the capability to rollback database transactions.

Traceability: ACCS-A1-100-006
Priority 1

3.2.1.2.1.13 The DMS shall provide capabilities which monitor for the occurrence of conditions established by the application. These capabilities shall also include the ability to notify the appropriate application processes when these conditions are satisfied.

Traceability: CHS
Priority 2

3.2.1.2.1.14 The DMS shall determine the best database copy to be used in a distributed and replicated database environment.

Traceability: CHS
Priority 3

3.2.1.2.1.15 The DMS shall provide the capability to create and add configuration information utilizing unique identifiers such as Configuration ID, Configuration Entry ID to identify the configuration data itself as well as the configuration entry data.

Traceability: ACCS-A1-100-006
Priority 2

3.2.1.2.1.16 The DMS shall provide the capability to save the configuration entry information.

Traceability: ACCS-A1-100-006
Related Requirement is 3.2.1.2.1.15
Priority 2

3.2.1.2.1.17 The DMS shall provide the capability to delete after confirmation, the configuration entry as specified by a unique configuration entry identifier.

Traceability: ACCS-A1-100-006
Priority 2

3.2.1.2.1.18 The DMS shall provide the capability to maintain mapping between logical database identifiers and physical locations to provide local transparency.

Traceability: ACCS-A1-100-006
Priority 1

3.2.1.2.1.19 The DMS shall provide the capability to use multiple local and remote databases concurrently.

Traceability: ACCS-A1-100-006
Priority 1

3.2.1.2.1.20 The DMS shall provide the capability to create, maintain, and delete multiple configurations of logical databases.

Traceability: ACCS-A1-100-006
Priority 1

3.2.1.2.1.21 The DMS shall provide the capability to replicate and distribute files and database updates.

Traceability: ACCS-A1-100-006
Priority 1

3.2.1.2.1.22 The DMS shall provide the capability to replicate only a subset of data in the database or have a different replication scheme for different subsets of data.

Traceability: ACCS-A1-100-006
Priority 2

3.2.1.2.1.23 The DMS shall provide replication capability to support distribution of data in an unstable tactical network. It shall provide data replication mechanisms to measure data concurrency and synchronize databases as required.

Traceability: ACCS-A1-100-006
Priority 2

3.2.1.2.1.24 The DMS shall provide the capability to set the update frequency as well as the replication type for replication processing.

Traceability: ACCS-A1-100-006
Related Requirement is 3.2.1.2.1.21
Priority 2

3.2.1.2.1.25 The DMS shall provide the capability to add or delete databases on different hosts (nodes on the network) dynamically.

Traceability: ACCS-A1-100-006
Priority 2

3.2.1.2.1.26 The DMS shall provide the capability to create configuration information on the destination of messages.

Traceability: ACCS-A1-100-006
Priority 2

3.2.1.2.1.27 The DMS shall provide the capability to manage configuration information on the destination of messages.

Traceability: ACCS-A1-100-006
Priority 2

3.2.1.2.1.28 The DMS shall provide the capability to maintain configuration information on the destination of messages.

Traceability: ACCS-A1-100-006
Priority 2

3.2.1.2.1.29 The DMS shall provide the capability to create configuration information on the domain and hosts of messages.

Traceability: ACCS-A1-100-006
Priority 2

3.2.1.2.1.30 The DMS shall provide the capability to manage configuration information on the domain and hosts of messages.

Traceability: ACCS-A1-100-006
Priority 2

3.2.1.2.1.31 The DMS shall provide the capability to maintain configuration information on the domain and hosts of messages.

Traceability: ACCS-A1-100-006
Priority 2

3.2.1.2.1.32 The DMS shall provide the capability to create configuration information on a class of messages which indicates a subset of replicated data for distribution.

Traceability: ACCS-A1-100-006
Priority 2

3.2.1.2.1.33 The DMS shall provide the capability to manage configuration information on a class of messages which indicates a subset of replicated data for distribution.

Traceability: ACCS-A1-100-006
Priority 2

3.2.1.2.1.34 The DMS shall provide the capability to maintain configuration information on a class of messages which indicates a subset of replicated data for distribution.

Traceability: ACCS-A1-100-006
Priority 2

3.2.1.2.1.35 The DMS shall provide the capability to create configuration information on the priority of messages.

Traceability: ACCS-A1-100-006
Priority 2

3.2.1.2.1.36 The DMS shall provide the capability to manage configuration information on the priority of messages.

Traceability: ACCS-A1-100-006
Priority 2

3.2.1.2.1.37 The DMS shall provide the capability to maintain configuration information on the priority of messages.

Traceability: ACCS-A1-100-006
Priority 2

3.2.1.2.1.38 The DMS shall provide the capability to create configuration information on message precedence.

Traceability: ACCS-A1-100-006
Priority 2

3.2.1.2.1.39 The DMS shall provide the capability to manage configuration information on message precedence.

Traceability: ACCS-A1-100-006
Priority 2

3.2.1.2.1.40 The DMS shall provide the capability to maintain configuration information on message precedence.

Traceability: ACCS-A1-100-006
Priority 2

3.2.1.2.1.41 The DMS shall provide a common Graphical User Interface (GUI) for all DMS tools.

Traceability: CHS
Priority 2

3.2.1.2.1.42 The DMS internal data distribution interface function shall operate in a heterogeneous platform/OS environment.

Traceability: DBWG
Priority 1

DA 3.2.1.2.2 Application Generation

DA 3.2.1.2.2.1 Application Generation Capabilities

3.2.1.2.2.1.1 The DMS shall provide the capability to create and maintain data entry forms using a standard forms generation language.

Traceability: ACCS-A1-100-006
Priority 2

3.2.1.2.2.1.2 The DMS shall provide the capability to create and maintain reports using a standard report specification language.

Traceability: ACCS-A1-100-006
Priority 2

3.2.1.2.2.1.3 The DMS shall provide the capability to embed API function calls in forms and report generation language specifications.

Traceability: ACCS-A1-100-006
Priority 1

3.2.1.2.2.1.4 The DMS shall provide the capability to integrate database objects including (but not limited to) maps, overlays, documents, reports, messages, and images.

Traceability: DBWG
Priority 3

DA 3.2.1.2.2.2 Database Query Processing

3.2.1.2.2.2.1 The DMS shall provide the capability to query for data records in the database.
Traceability: DBWG
Priority 1

3.2.1.2.2.2.2 The DMS shall provide the capability to build and execute queries on an ad hoc basis in order to produce special reports that are not previously formatted and available through the database applications themselves.

Traceability: AGCCS
Priority 2

3.2.1.2.2.2.3 The DMS shall provide the capability to perform ad hoc (i.e. relational, spatial, combined) database queries.

Traceability: AGCCS
Priority 1

3.2.1.2.2.2.4 The DMS shall provide the capability for multiple local and remote application programs to access the database functionality to concurrently query a single database.

Traceability: AGCCS
Priority 1

3.2.1.2.2.2.5 The DMS shall provide the capability for application programs to access the database functionality to query multiple local and remote databases concurrently by determining the location of the data and sending the query to the appropriate database.

Traceability: DBWG
Priority 1

DA 3.2.1.2.2.3 Database Backup and Restore Processing

3.2.1.2.2.3.1 The DMS shall be able to compress all the data offloaded at the user's discretion and automatically decompress all the restored data when the DMS detects that the user is attempting to restore compressed data.

Traceability: JOPES
Priority 3

3.2.1.2.2.3.2 The DMS shall archive data at the user's discretion and restore the data when directed.

Traceability: DBWG
Priority 1

3.2.1.2.2.3.3 The DMS shall provide to the application on request an audit report containing all records that were rejected during the offload or during the load. The report shall indicate the reason each record was rejected.

Traceability: JOPES
Priority 2

DA 3.2.1.2.2.4 Performance Optimization

3.2.1.2.2.4.1 The DMS shall provide the capability to optimize data traffic to improve communication performance.

Traceability: CHS
Priority 2

3.2.1.2.2.4.2 The DMS shall provide the capability to reduce the size of data messages.

Traceability: CHS
Priority 2

3.2.1.2.2.4.3 The DMS shall provide the capability to optimize data queues.

Traceability: ACCS-A1-100-006
Priority 2

DA 3.2.1.2.2.5 Database Journal Processing

3.2.1.2.2.5.1 The DMS shall provide the capability to create a database journal.

Traceability: CHS
Priority 1

3.2.1.2.2.5.2 The DMS shall provide the capability to enable the logging of transactions in a database journal.

Traceability: CHS
Priority 1

3.2.1.2.2.5.3 The DMS shall provide the capability to disable the logging of transactions in a database journal.

Traceability: CHS
Priority 1

3.2.1.2.2.5.4 The DMS shall provide the capability to empty the contents of a database journal.

Traceability: CHS
Priority 1

DA 3.2.1.2.2.5.5 The DMS shall provide a rollforward capability to apply journalled transactions to a backup database copy. An error shall be returned if journalling is disabled.

Traceability: CHS
Priority 1

DA 3.2.1.2.2.6 Database Manipulation

3.2.1.2.2.6.1 The DMS shall provide generic views and definitions of the underlying database structure.

Traceability: DBWG
Priority 1

3.2.1.2.2.6.2 The DMS shall provide the capability through API function calls for applications to access the database, tables, or views.

Traceability: DBWG
Priority 1

3.2.1.2.2.6.3 The DMS shall provide the capability to view data records in the database.

Traceability: AGCCS
Priority 1

3.2.1.2.2.6.4 The DMS shall provide the capability to print data records in the database.

Traceability: AGCCS
Priority 1

3.2.1.2.2.6.5 The DMS shall provide the capability to generate reports with data from the database.

Traceability: AGCCS
Priority 1

3.2.1.2.2.6.6 The DMS shall provide the capability to read data in the databases.

Traceability: AGCCS
Priority 1

3.2.1.2.2.6.7 The DMS shall provide the capability to modify data in the databases.

Traceability: AGCCS
Priority 1

3.2.1.2.2.6.8 The DMS shall provide the capability to retrieve data according multiple search criteria.

Traceability: AGCCS
Priority 1

DA 3.2.1.2.2.6.9 The DMS shall support the capability to create a new view based upon existing tables and views in the database.

Traceability: CHS
Priority 1

DA 3.2.1.2.2.6.10 The DMS shall support the capability to delete a specified view. All views defined in terms of the specified view shall also be deleted.

Traceability: CHS
Priority 1

DA 3.2.1.2.2.7 Database Locking

3.2.1.2.2.7.1 The DMS shall provide the capability to enable/disable database transaction-level locking.

Traceability: AGCCS
Priority 2

3.2.1.2.2.7.2 The DMS shall provide the capability to enable/disable record, row, and table locking.

Traceability: AGCCS
Priority 1

3.2.1.2.2.7.3 The DMS shall enable an application to place a read (share) or write (exclusive) lock on all data contained in a table.

Traceability: CHS
Priority 1

DA 3.2.1.2.2.7.4 The DMS shall enable a user-configurable default time-out to be imposed on table locks in order to avoid deadlock.

Traceability: CHS
Priority 1

DA 3.2.1.2.2.7.5 The DMS shall enable an application to unlock a table by means of deleting a read or write lock which was previously placed on the table.

Traceability: CHS
Priority 1

DA 3.2.1.2.2.7.6 The DMS shall enable an application to place a read (share) or write (exclusive) lock on a record or a set of records.

Traceability: CHS
Priority 1

DA 3.2.1.2.2.7.7 The DMS shall enable an application to unlock a record or a set of records by means of deleting a read or write lock which was previously placed on the record(s).

Traceability: CHS
Priority 1

DA 3.2.1.2.2.7.8 The DMS shall enable an application to change the type of lock currently in use on the locked table or records, i.e. from read to write and vice versa.

Traceability: CHS
Priority 2

DA 3.2.1.2.2.7.9 The DMS shall enable an application to request a group of locks where either all locks are obtained successfully or none are obtained. This is an alternative measure for avoiding deadlock.

Traceability: CHS
Priority 1

DA 3.2.1.2.2.7.10 The DMS shall enable an application to delete all locks associated with a specified lock group.

Traceability: CHS
Priority 1

DA 3.2.1.2.3 Distributed Database Services

DA 3.2.1.2.3.1 Database Integrity/Consistency

3.2.1.2.3.1.1 The DMS shall provide data access to heterogeneous databases in accordance with Remote Data Access (RDA) Standards.

Traceability: ACCS-A1-100-006
Priority 1

3.2.1.2.3.1.2 The DMS shall automatically maintain data integrity/consistency among all (replicated or mirrored) copies of the same databases that may exist throughout the network.

Traceability: AGCCS
Priority 1

3.2.1.2.3.1.3 The DMS shall provide the capability to manually initiate integrity/consistency processing.

Traceability: AGCCS
Priority 1

3.2.1.2.3.1.4 The DMS shall provide the capability to manually terminate integrity/consistency processing.

Traceability: AGCCS
Priority 1

DA 3.2.1.2.3.2 Database Updating

3.2.1.2.3.2.1 The DMS shall provide the capability to add data records into a distributed database.

Traceability: DBWG
Priority 1

3.2.1.2.3.2.2 The DMS shall provide the capability to update data records in a distributed database.

Traceability: DBWG
Priority 1

3.2.1.2.3.2.3 The DMS shall provide the capability to delete data records from a distributed database.

Traceability: DBWG
Priority 1

3.2.1.2.3.2.4 The DMS shall provide the capability to accept database auto-update messages when databases are being backed up or restored.

Traceability: AGCCS
Priority 2

3.2.1.2.3.2.5 The DMS shall provide the capability to update the database after it is backed up or restored with accepted database auto-update messages.

Traceability: AGCCS
Priority 2

3.2.1.2.3.2.6 The DMS shall provide the capability to recover from database update transactions when replicates are found to be deficient.

Traceability: AGCCS
Priority 2

3.2.1.2.3.2.7 The DMS shall provide database update notification to requesting client applications.

Traceability: ACCS-A1-100-006
Priority 2

3.2.1.2.3.2.8 The DMS shall provide the capability to accept database auto-update messages.

Traceability: AGCCS
Priority 2

3.2.1.2.3.2.9 The DMS shall automatically provide notification of database updates to appropriate applications displaying the affected data.

Traceability: AGCCS
Priority 2

3.2.1.2.3.2.10 The DMS shall provide the capability to support synchronous distributed database updates via the two-phase commit logic.

Traceability: DBWG
Priority 1

3.2.1.2.3.2.11 The DMS shall provide the capability to create and add a configuration entry to a specified table.

Traceability: DBWG
Priority 2

3.2.1.2.3.2.12 The DMS shall provide the capability to delete a configuration entry from a specified table.

Traceability: DBWG
Priority 2

DA 3.2.1.2.3.3 Database Servers

3.2.1.2.3.3.1 The DMS shall provide the capability to detect database server failures and direct database queries to alternate servers.

Traceability: ACCS-A1-100-006
Priority 2

3.2.1.2.3.3.2 The DMS shall provide the capability to store and forward database updates for servers that are not accessible through the network.

Traceability: ACCS-A1-100-006
Priority 2

3.2.1.2.3.3.3 The DMS shall forward database updates to addressed database servers once connectivity is established.

Traceability: AGCCS
Priority 2

3.2.1.2.3.3.4 The DMS shall provide the capability to connect to any database server in the network.

Traceability: DBWG
Priority 1

DA 3.2.1.2.3.4 Data Exchange Capabilities

3.2.1.2.3.4.1 The DMS shall provide the capability to exchange graphics and text data between nodes.

Traceability: AGCCS
Priority 3

3.2.1.2.3.4.2 The DMS shall provide the capability to transfer data to multiple destinations.

Traceability: DBWG
Priority 1

3.2.1.2.3.4.3 The DMS shall support location transparency of data which allows applications to access data independent of its physical location.

Traceability: DBWG
Priority 1

3.2.1.2.3.4.4 The DMS shall provide the capability for distributed database access and information exchange via all available communications media.

Traceability: DBWG
Priority 2

3.2.1.2.3.4.5 The DMS shall provide the capability to support multiple logical database configurations.

Traceability: DBWG
Priority 1

DA 3.2.1.2.3.5 Transaction Processing by Precedence

3.2.1.2.3.5.1 The DMS shall provide the capability to time stamp database records.

Traceability: ACCS-A1-100-006
Priority 2

3.2.1.2.3.5.2 The DMS shall provide the capability to queue all database transactions by precedence and within precedence by time of receipt.

Traceability: AGCCS
Priority 2

3.2.1.2.3.5.3 The DMS shall service each database transaction by precedence and within precedence by time of receipt.

Traceability: AGCCS
Priority 2

3.2.1.2.3.5.4 The DMS shall queue undeliverable database updates by precedence and within precedence by time of receipt.

Traceability: AGCCS
Priority 2

3.2.1.2.3.5.5 The DMS shall provide the capability to time stamp data fields.

Traceability: AGCCS
Priority 1

3.2.1.2.3.5.6 The DMS shall provide the capability to store data records by time slice.

Traceability: AGCCS
Priority 2

3.2.1.2.3.5.7 The DMS shall provide the capability to retrieve historical data from data records stored by time slice.

Traceability: AGCCS
Priority 2

3.2.1.2.3.5.8 The DMS shall provide the means to assign precedence classes to all information transfers.
Traceability: AGCCS
Priority 2

3.2.1.2.3.5.9 The DMS shall assign a default precedence (routine) if no precedence is assigned.
Traceability: AGCCS
Priority 2

DA 3.2.1.2.3.6 Database Replication

3.2.1.2.3.6.1 The DMS shall provide the capability to create replicated databases.
Traceability: ACCS-A1-100-006
Priority 1

3.2.1.2.3.6.2 The DMS shall provide the capability to store replicated databases.
Traceability: ACCS-A1-100-006
Priority 1

3.2.1.2.3.6.3 The DMS shall provide the capability to update replicated databases.
Traceability: ACCS-A1-100-006
Priority 1

3.2.1.2.3.6.4 The DMS shall provide the capability to activate replicated databases.
Traceability: ACCS-A1-100-006
Priority 1

3.2.1.2.3.6.5 The DMS shall provide the capability for an application program to define dynamically the database proponent scheme.
Traceability: AGCCS
Priority 3

3.2.1.2.3.6.6 The DMS shall provide the capability for an application program to create mirrored databases of selected operational databases.
Traceability: CHS
Priority 2

3.2.1.2.3.6.7 The DMS shall provide the capability for an application program to store mirrored databases of selected operational databases.
Traceability: CHS
Priority 2

3.2.1.2.3.6.8 The DMS shall provide the capability for an application program to update mirrored databases of selected operational databases.
Traceability: CHS
Priority 2

3.2.1.2.3.6.9 The DMS shall provide the capability for an application program to activate mirrored databases of selected operational databases.
Traceability: CHS
Priority 2

3.2.1.2.3.6.10 The DMS shall provide the capability for an application program to access mirrored databases of selected operational databases.
Traceability: CHS
Priority 2

3.2.1.2.3.6.11 The DMS replication service shall replicate the minimum information necessary to update the database.

Traceability: DBWG
Priority 2

3.2.1.2.3.6.12 The DMS shall provide the capability to ensure replicated database updates are applied based on age of data criteria.

Traceability: ACCS-A1-100-006
Priority 2

3.2.1.2.3.6.13 The DMS shall provide the capability to replicate databases in accordance with the security classification or authorization level of the workstations. (Cross reference with the Security Administration SRS).

Traceability: AGCCS
Priority 2

3.2.1.2.3.6.14 The DMS shall provide the capability to notify the application when a replicated database update conflict occurs.

Traceability: DBWG
Priority 1

3.2.1.2.3.6.15 The DMS shall provide the capability to dynamically activate the database replication scheme.

Traceability: AGCCS
Priority 2

3.2.1.2.3.6.16 The DMS shall provide the capability to deactivate the database replication scheme.

Traceability: AGCCS
Priority 2

3.2.1.2.3.6.17 The DMS shall provide replication services that should support the replication of data fields, tables, columns and rows of tables, and database schema.

Traceability: DBWG
Priority 1

3.2.1.2.3.6.18 The DMS shall provide conflict resolution services based on a variety of replication processing criteria: time stamp, priority of server, etc.

Traceability: DBWG
Priority 2

3.2.1.2.3.6.19 The DMS shall provide the capability to replication transactions for both synchronize and asynchronize databases.

Traceability: DBWG
Priority 1

3.2.1.2.3.6.20 The DMS shall support a real time forwarded data replication scheme.

Traceability: CHS
Priority 2

3.2.1.2.3.6.21 The DMS shall provide the interfaces and mechanisms necessary to support a batch replication scheme in which an entire database can be copied in bulk across the network to a replicated location at specified intervals.

Traceability: CHS
Priority 1

DA 3.2.1.2.3.6.22 The DMS shall provide the capability to request the forwarding of lost transactions from the originating replicate location.

Traceability: ACCS-A1-100-006
Priority 2

DA 3.2.1.2.3.7 Distributed Database Processing

3.2.1.2.3.7.1 The DMS shall provide the capability to forward all database transactions to any available database server on the network capable of servicing the request.

Traceability: DBWG
Priority 2

3.2.1.2.3.7.2 The DMS shall provide the capability to manually override the automatic features.

Traceability: DBWG
Priority 1

3.2.1.2.3.7.3 The DMS shall provide the capability to load spatial databases.

Traceability: AGCCS
Priority 3

3.2.1.2.3.7.4 The DMS shall provide the capability to unload spatial databases.

Traceability: AGCCS
Priority 3

3.2.1.2.3.7.5 The DMS shall provide the capability to load relational databases.

Traceability: AGCCS
Priority 1

3.2.1.2.3.7.6 The DMS shall provide the capability to unload relational databases.

Traceability: AGCCS
Priority 1

3.2.1.2.3.7.7 The DMS shall provide the capability to delete replicated databases.

Traceability: DBWG
Priority 1

3.2.1.2.3.7.8 The DMS shall provide the capability to delete selected database(s) at the request of an application program.

Traceability: DBWG
Priority 1

3.2.1.2.3.7.9 The DMS shall provide the capability to delete all databases at the request of an application program.

Traceability: DBWG
Priority 1

3.2.1.2.3.7.10 The DMS internal data distribution interface function shall fully implement open data access standards such as RDA, SQL/CLI, etc.

Traceability: DBWG
Priority 2

DA 3.2.1.2.4 Data Dictionary Services

3.2.1.2.4.1 The DMS shall provide the capability to provide database dictionary support (e.g. data definition maintenance).

Traceability: DBWG
Priority 1

3.2.1.2.4.2 The DMS shall provide the capability to compare newly-updated database data to application program-supplied old database data in order to identify changes in data fields within the database.

Traceability: AGCCS
Priority 2

- 3.2.1.2.4.3 The DMS shall provide the capability to create libraries of data.
Traceability: AGCCS
Priority 2
- 3.2.1.2.4.4 The DMS shall provide the capability to maintain libraries of data.
Traceability: AGCCS
Priority 2
- 3.2.1.2.4.5 The DMS shall provide the capability to delete libraries of databases on defined source access rights.
Traceability: AGCCS
Priority 2
- 3.2.1.2.4.6 The DMS shall provide the capability to access libraries of data, based on defined source access rights.
Traceability: AGCCS
Priority 2
- 3.2.1.2.4.7 The DMS shall provide the capability to access sequential, indexed sequential, and direct access file data.
Traceability: AGCCS
Priority 1
- 3.2.1.2.4.8 The DMS shall provide data dictionary services through an API, which will provide at a minimum search, display, and update services.
Traceability: ACCS-A1-100-006
Priority 2
- 3.2.1.2.4.9 The DMS shall provide the capability to perform searches of the database.
Traceability: DBWG
Priority 1
- 3.2.1.2.4.10 The DMS shall provide the capability to perform data retrievals based on key words.
Traceability: DBWG
Priority 1
- 3.2.1.2.4.11 The DMS shall provide the capability to sort the database based on the contents of any field or set of fields within the database or subset of the database(tables) (i.e. DTG).
Traceability: DBWG
Priority 1
- 3.2.1.2.4.12 The DMS shall provide a data dictionary for all data definitions accessible from any workstation/client application on the network.
Traceability: ACCS-A1-100-006
Priority 2
- 3.2.1.2.4.13 The DMS shall provide the capability to merge databases based on the contents of any field or set of fields within the database or subset of the database(tables) (i.e. DTG).
Traceability: DBWG
Priority 1

DA 3.2.2 Data Administration Requirements

DA 3.2.2.1 File Administration Requirements

DA 3.2.2.1.1 The DMS shall provide data administration tools for the maintenance of files. These administration functions are required for the general care and good condition of the system.

Traceability: FMWG

Priority 2

DA 3.2.2.1.2 The DMS shall provide the ability to export file(s) over DII COE communication media and optionally notify the client, in accordance with (IAW) client set parameters, on completion of the task.

Traceability: JMCIS

Priority 1

DA 3.2.2.1.3 The DMS shall provide the ability to import file(s) over DII COE communication media and optionally notify the client, IAW client set parameters, on completion of the task.

Traceability: JMCIS

Priority 1

DA 3.2.2.1.4 The DMS shall provide the ability to compress, when the client has selected compression, and archive file(s) over DII COE communication media and optionally notify the client, IAW client set parameters, on completion of the task.

Traceability: JMCIS

Priority 1

DA 3.2.2.1.5 The DMS shall provide the ability to uncompress and restore file(s) over DII COE communication media and optionally notify the client, IAW client set parameters, on completion of the task.

Traceability: JMCIS

Priority 1

3.2.2.1.6 The DMS shall provide a capability to establish file servers (e.g. DCE file servers).

Traceability: ARMY

Priority 1

DA 3.2.2.1.7 The DMS shall provide the capability to enforce the denial or granting of access to any database IAW Access Control Lists.

Traceability: SWG

Priority 1

DA 3.2.2.2 Utilities

DA 3.2.2.2.1 The DMS shall provide utilities to aid in the development and debug of COE and Mission applications and the notification of system administration events.

Traceability: FMWG

Priority 2

DA 3.2.2.2.2 The DMS shall provide a capability to dump files. The dumps shall be able to display text and binary files in decimal, octal and hexadecimal format. (Cross reference with Developers Kit).

Traceability: FMWG

Priority 1

DA 3.2.2.2.3 The DMS shall provide a capability to print files. The contents of a file shall be able to be spooled to a printer by users, applications, and software/system developers.

Traceability: FMWG
Priority 1

DA 3.2.2.3 Database Administration Requirements

There are four primary classifications of capabilities provided by the DMS Database Administration functions:

- Database Administration
- Distributed Database Administration
- Database Administration Utilities
- Database Structure Definition and Manipulation

DMS Database Administration function encapsulates the techniques, methods, tools, and utilities by which the DMS Database Access capabilities are implemented. It is concerned with the actual COTS database implementations. These implementations include Oracle, Sybase, and Informix. The services provided by this subfunction are related to the tasks of installing, monitoring, and maintaining the COTS environment. Where applicable, a common Graphical User interface and associated API to the COTS/GOTS product administration tools will be used. This will ensure common functions and data necessary to control the database environment will have the same look and feel for the database administrator.

Distributed database administration deals with the initialization, startup, monitoring, and shutdown of the DII COE Data Distribution Capability. The DII COE Data Distribution capability isolates DII COE applications from a set of underlying network database services. These services include distributed database query support, database update replication, and database update notification. In addition, it provides a capability to logically create instances of the distributed database to support simultaneous operation of exercise and operational missions.

The Database Administration Utilities provide the capabilities for archiving, and compressing database files. In addition, it provides capabilities for selectively loading database tables from delimited files.

DA 3.2.2.3.1 Database Administration Services Capabilities

3.2.2.3.1.1 The DMS shall provide an interface for applications to administer database management capabilities.

Traceability: DBWG
Priority 1

3.2.2.3.1.2 The DMS shall provide the capability to view and edit configuration parameters.

Traceability: DBWG
Priority 1

3.2.2.3.1.3 The DMS shall provide the capability to manually override the automatic features.

Traceability: DBWG
Priority 1

DA 3.2.2.3.1.4 The DMS shall provide the capability to allocate and manage database disk storage space.

Traceability: DBWG
Priority 1

3.2.2.3.1.5 The DMS function shall provide a common Motif Graphical User Interface (GUI) to implement administration user functions.

Traceability: CHS
Priority 1

3.2.2.3.1.6 The DMS function shall provide a standard Application Programmers Interface (API) for database administration.

Traceability: CHS
Priority 2

3.2.2.3.1.7 The DMS shall provide a common (GUI) for all COTS/GOTS database administration tools.

Traceability: CHS
Priority 2

DA 3.2.2.3.2 Data Exchange Requirements

3.2.2.3.2.1 The DMS shall provide the capability to specify the format for data exchange between nodes.

Traceability: AGCCS
Priority 2

3.2.2.3.2.2 The DMS shall provide the capability to specify the format for data exchange between workstations.

Traceability: AGCCS
Priority 2

3.2.2.3.2.3 The DMS shall provide the capability to specify the format for data exchange between functions.

Traceability: AGCCS
Priority 2

3.2.2.3.2.4 The DMS shall provide the capability to specify the format for data exchange between users.

Traceability: AGCCS
Priority 2

3.2.2.3.2.5 The DMS shall provide the capability to specify where and when data is exchanged.

Traceability: DBWG
Priority 2

DA 3.2.2.3.3 Backup and Restore Requirements

3.2.2.3.3.1 The DMS shall provide the GUI to backup and restore the database.

Traceability: ACCS-A1-100-006
Priority 1

3.2.2.3.3.2 The DMS shall provide the capability to direct database auto-updates when databases are being backed up or restored.

Traceability: DBWG
Priority 2

3.2.2.3.3.3 The DMS shall provide the capability to maintain and view database audit trails.

Traceability: ACCS-A1-100-006
Priority 1

3.2.2.3.3.4 The DMS shall provide the capability to activate or deactivate the database management system itself.

Traceability: DBWG
Priority 1

3.2.2.3.3.5 The DMS shall provide the capabilities for recovery of a corrupted database.

Traceability: DBWG
Priority 1

3.2.2.3.3.6 The DMS shall provide services which support various types of backups, such as full backups, incremental since last backup, and incremental since a specified last modification date.

Traceability: DBWG
Priority 2

DA 3.2.2.3.3.7 The DMS shall enable read and write accesses to continue while backups are being performed.

Traceability: AGCCS
Priority 2

DA 3.2.2.3.4 Data Dictionary Requirements

3.2.2.3.4.1 The DMS shall provide the capability to create, maintain, and provide access to the data dictionary.

Traceability: ACCS-A1-100-006
Priority 1

DA 3.2.2.3.5 Database Access and Security Requirements

3.2.2.3.5.1 The DMS shall provide the capability to monitor user access to the database.

Traceability: ACCS-A1-100-006
Priority 1

3.2.2.3.5.2 The DMS shall provide the capability to establish and maintain database security (grant permissions). This security access includes the creation, deletion, and modification of database access permissions by user, workstation, or user functional role. Access privileges will include table, view, row and field level access.

Traceability: ACCS-A1-100-006
Priority 2

3.2.2.3.5.3 The DMS shall provide the capability to retrieve databases selected by an application program from a remote site workstation provided the requester has access to that database and the workstation to which the data is returned has the same or higher security level authorization.

Traceability: AGCCS
Priority 2

3.2.2.3.5.4 The DMS shall provide the capability for the monitoring of optional security relevant events, such as: attempts to change discretionary access controls, and attempts to create, copy, sanitize, purge, or execute databases.

Traceability: CHS
Priority 2

3.2.2.3.5.5 The DMS shall provide the capability for the monitoring of optional security relevant events to be suspended.

Traceability: CHS
Priority 2

DA 3.2.2.3.6 Discretionary Access Control (DAC)

3.2.2.3.6.1 The DMS shall provide the capability to enforce data access controls based on the discretionary access control requirements.

Traceability: SWG
Priority ???

3.2.2.3.6.2 The DMS shall provide the capability to restrict access to files based on the user's identity and on access modes (e.g. read, write, execute).

Traceability: SWG
Priority ???

3.2.2.3.6.3 The DMS shall define and control access between named users and names objects (e.g., files and programs).

Traceability: SWG
Priority ???

3.2.2.3.6.4 The DMS shall allow users to specify and control sharing of objects by named individuals or defined groups of individuals, or by both.

Traceability: SWG
Priority ???

3.2.2.3.6.5 The DMS shall, either by explicit user action or by default, protect objects from unauthorized access.

Traceability: SWG
Priority ???

3.2.2.3.6.6 The DMS shall be capable of including or excluding access to each object on a per user and on a per group basis.

Traceability: SWG
Priority ???

3.2.2.3.6.7 The DMS shall ensure that access permission to an object by users not already possessing access permission shall only be assigned by authorized users (e.g. system administrators).

Traceability: SWG
Priority ???

3.2.2.3.6.8 The DMS shall permit a user to grant or revoke access to an object only if the user has control permission to that object.

Traceability: SWG
Priority ???

3.2.2.3.6.9 The DMS shall be used within the COE to maintain logical separation among users, based on need to know.

Traceability: SWG
Priority ???

DA 3.2.2.3.7 Mandatory Access Control (MAC)

3.2.2.3.7.1 The DMS shall only permit access to classified information to authorized users with a clearance level equal to or higher than the information's assigned classification.

Traceability: SWG
Priority ???

3.2.2.3.7.2 The DMS shall ensure that subjects and objects shall be assigned sensitivity labels that are a combination of classification levels and categories, and the labels shall be used as the basis for mandatory access control decisions.

Traceability: SWG
Priority ???

3.2.2.3.7.3 The DMS shall support two or more such security levels.

Traceability: SWG
Priority ???

3.2.2.3.7.4 The following requirements shall hold for all accesses between subjects external to the DMS and all objects directly or indirectly accessible by these subjects:

Traceability: SWG
Priority ???

3.2.2.3.7.4.1 A subject can read an object only if the classification in the subject's security level is greater than or equal to the classification in the object's security level and the categories in the subject's security level include all the categories in the object's security level.

Traceability: SWG
Priority ???

3.2.2.3.7.4.2 A subject can write an object only if the classification in the subject's security level is less than or equal to the classification in the object's security level and all the categories in the subject's security level are included in the categories of the object's security level.

Traceability: SWG
Priority ???

DA 3.2.2.3.8 Sensitivity Labels

3.2.2.3.8.1 The DMS shall use sensitivity labels as the basis for mandatory access control decisions.

Traceability: SWG
Priority ???

3.2.2.3.8.2 The DMS sensitivity labels shall accurately represent security levels of the specific subjects or objects with which they are associated.

Traceability: SWG
Priority ???

3.2.2.3.8.3 The DMS shall ensure that when data is exported the sensitivity labels shall accurately and unambiguously represent the internal labels and shall be associated with the information being exported.

Traceability: SWG
Priority ???

DA 3.2.2.4 Distributed Database Administration

DA 3.2.2.4.1 Distributed Database Capabilities

3.2.2.4.1.1 The DMS shall provide the capability to create and maintain a list of logical databases.

Traceability: DBWG
Priority 1

3.2.2.4.1.2 The DMS shall support the ability to determine which logically separate databases exist.

Traceability: DBWG
Priority 2

3.2.2.4.1.3 The DMS shall provide the capability to establish and maintain multiple logical databases.

Traceability: ACCS-A1-100-006
Priority 1

3.2.2.4.1.4 The DMS shall provide the capability to create databases.

Traceability: AGCCS
Priority 1

- 3.2.2.4.1.5 The DMS shall provide the capability to create replicated databases.
Traceability: DBWG
Priority 1
- 3.2.2.4.1.6 The DMS shall provide the capability to load relational databases.
Traceability: AGCCS
Priority 1
- 3.2.2.4.1.7 The DMS shall provide the capability to store replicated databases.
Traceability: DBWG
Priority 1
- 3.2.2.4.1.8 The DMS shall provide the capability to update replicated databases.
Traceability: DBWG
Priority 1
- 3.2.2.4.1.9 The DMS shall provide the capability to activate replicated databases.
Traceability: DBWG
Priority 1
- 3.2.2.4.1.10 The DMS shall provide the capability to open a database.
Traceability: AGCCS
Priority 1
- 3.2.2.4.1.11 The DMS shall provide the capability to close a database.
Traceability: AGCCS
Priority 1
- 3.2.2.4.1.12 The DMS shall provide the capability to delete databases.
Traceability: AGCCS
Priority 1
- 3.2.2.4.1.13 The DMS shall provide the capability to purge databases.
Traceability: AGCCS
Priority 2
- 3.2.2.4.1.14 The DMS shall provide the capability to unload relational databases.
Traceability: AGCCS
Priority 1
- 3.2.2.4.1.15 The DMS shall provide the capability to load spatial databases.
Traceability: AGCCS
Priority 3
- 3.2.2.4.1.16 The DMS shall provide the capability to unload spatial databases.
Traceability: AGCCS
Priority 3
- 3.2.2.4.1.17 The DMS shall provide the capability to delete selected database(s) at the request of an application program.
Traceability: DBWG
Priority 1
- 3.2.2.4.1.18 The DMS shall provide the capability to delete all databases at the request of an application program.
Traceability: DBWG
Priority 1

3.2.2.4.1.19 The DMS shall at the clients request, display data elements used across databases.

Traceability: DBWG
Priority 2

DA 3.2.2.4.2 Database Replication

3.2.2.4.2.1 The DMS shall provide the capability for an application program to define dynamically the database replication scheme.

Traceability: ACCS-A1-100-006
Priority 3

3.2.2.4.2.2 The DMS shall provide the capability to dynamically activate the database replication scheme.

Traceability: ACCS-A1-100-006
Priority 3

3.2.2.4.2.3 The DMS shall provide the capability to deactivate the database replication scheme.

Traceability: ACCS-A1-100-006
Priority 2

3.2.2.4.2.4 The DMS shall provide the capability for an application program to define dynamically the database proponent scheme.

Traceability: ACCS-A1-100-006
Priority 3

3.2.2.4.2.5 The DMS shall provide the capability to delete replicated databases.

Traceability: DBWG
Priority 2

3.2.2.4.2.6 The DMS shall provide the capability for an application program to create mirrored databases of selected operational databases.

Traceability: CHS
Priority 2

3.2.2.4.2.7 The DMS shall provide the capability for an application program to store mirrored databases of selected operational databases.

Traceability: CHS
Priority 2

3.2.2.4.2.8 The DMS shall provide the capability for an application program to activate mirrored databases of selected operational databases.

Traceability: CHS
Priority 2

3.2.2.4.2.9 The DMS shall provide the administration tools that need to be developed to support the monitoring of replication status.

Traceability: DBWG
Priority 2

3.2.2.4.2.10 The DMS shall enable/disable database mirroring (to provide non-stop recovery in the event of media failure).

Traceability: CHS
Priority 1

DA 3.2.2.4.3 Distributed Database Updating

3.2.2.4.3.1 The DMS shall provide the capability to determine which databases accept database auto-update messages.

Traceability: DBWG
Priority 2

3.2.2.4.3.2 The DMS shall set the precedence of queues for undeliverable database updates.

Traceability: DBWG
Priority 2

3.2.2.4.3.3 The DMS shall provide the capability to transfer database update queues to magnetic media (i.e., tape, floppy disk).

Traceability: DBWG
Priority 2

3.2.2.4.3.4 The DMS shall provide the capability for an application program to dynamically modify the update frequency of replicated databases.

Traceability: ACCS-A1-100-006
Priority 1

DA 3.2.2.4.4 Distributed Database Servers

3.2.2.4.4.1 The DMS shall provide the capability to create and maintain database servers.

Traceability: ACCS-A1-100-006
Priority 1

3.2.2.4.4.2 The DMS shall direct what database updates are forwarded to addressed database servers once connectivity is established.

Traceability: AGCCS
Priority 1

3.2.2.4.4.3 The DMS shall provide the capability to initialize a database server.

Traceability: ACCS-A1-100-006
Priority 1

3.2.2.4.4.4 The DMS shall provide the capability to control any data distribution server, (given appropriate access control mechanisms that will ensure that a database administrator at one site cannot easily alter the configuration of another site's database).

Traceability: ACCS-A1-100-006
Priority 2

3.2.2.4.4.5 The DMS shall provide the capability to shut down a database server.

Traceability: ACCS-A1-100-006
Priority 1

DA 3.2.2.5 Database Administration Utilities

DA 3.2.2.5.1 Database Load Utilities

3.2.2.5.1.1 The DMS shall provide the capability to load database files.

Traceability: AGCCS
Priority 1

3.2.2.5.1.2 The DMS shall provide the capability to unload database files.

Traceability: AGCCS
Priority 1

3.2.2.5.1.3 The DMS shall provide the capability to bulk load data into the database tables.

Traceability: AGCCS
Priority 1

3.2.2.5.1.4 The DMS shall provide the capability to selectively populate the database including updates and reloads.

Traceability: DBWG
Priority 2

DA 3.2.2.5.2 Database Integrity/Consistency Utilities

3.2.2.5.2.1 The DMS shall incorporate utilities to maintain data integrity/consistency among all copies of the same databases that may exist throughout the network.

Traceability: AGCCS
Priority 1

3.2.2.5.2.2 The DMS shall incorporate utilities to provide the capability to manually initiate integrity/consistency processing.

Traceability: AGCCS
Priority 1

3.2.2.5.2.3 The DMS shall incorporate utilities to provide the capability to manually terminate integrity/consistency processing.

Traceability: AGCCS
Priority 1

DA 3.2.2.5.3 Data Manipulation and Maintenance Utilities

3.2.2.5.3.1 The DMS shall provide the capability to automatically archive some or all of the data captured and processed within the database(s) as specified by the administrator.

Traceability: DBWG
Priority 1

3.2.2.5.3.2 The DMS shall provide data storage, archiving and restore services.

Traceability: AGCCS
Priority 1

3.2.2.5.3.3 The DMS shall provide industry standard data compression capabilities. This includes compression utilities such as pkzip, gzip, pkarc, etc.

Traceability: ACCS-A1-100-006
Priority 2

3.2.2.5.3.4 The DMS shall provide the capability to convert data between versions of the database.

Traceability: DBWG
Priority 1

DA 3.2.2.5.4 Database Administration Configuration Utilities

3.2.2.5.4.1 The DMS shall provide the capability to configure reusable system or database utilities, (that is to provide the capability to generate or configure a site, or its application code, or its database-specific utilities and tailoring them to the site's specific needs).

Traceability: DBWG
Priority 3

DA 3.2.2.6 Database Structure Definition and Manipulation

DA 3.2.2.6.1 Database Structure Requirements

3.2.2.6.1.1 The DMS shall support mechanisms that provide data pertaining to the database configuration and structure.

Traceability: ACCS-A1-100-006
Priority 1

DA 3.2.2.6.2 Database Table Requirements

3.2.2.6.2.1 The DMS shall provide the capability to define and maintain table structures in the current database.

Traceability: CHS
Priority 1

3.2.2.6.2.2 The DMS shall support operations to get data pertaining to the database configuration and structure, i.e., the size of a database, the list of tables in the database, the location of the database, the journalling and optional security monitoring status, etc.

Traceability: CHS
Priority 1

DA 3.2.2.6.3 Database Column Requirements

3.2.2.6.3.1 The DMS shall provide the capability to specify columns to be added, modified, and/or deleted within databases.

Traceability: CHS
Priority 1

DA 3.2.2.6.4 Database Attribute Requirements

3.2.2.6.4.1 The DMS shall provide the capability to specify attributes to be added, modified, and/or deleted within databases.

Traceability: DBWG
Priority 2

3.2.2.6.4.2 The DMS provides the capability to identify the attributes and attribute characteristics which make up tables within database.

Traceability: DBWG
Priority 2

3.2.2.6.4.3 The DMS shall support the establishment, management, and administration of replication domains defined at the data element (attribute or field) level.

Traceability: DBWG
Priority 2

DA 3.2.2.6.5 Database View and Cursor Requirements

3.2.2.6.5.1 The DMS shall provide for the establishment of generic views and definitions of underlying database structures.

Traceability: DBWG
Priority 1

DA 3.2.2.6.5.2 The DMS shall support the capability to create new views.

Traceability: DBWG
Priority 1

3.2.2.6.5.3 The DMS shall support the capability to delete a specified view. All views defined in terms of the specified view shall also be deleted.

Traceability: DBWG
Priority 1

DA 3.2.2.6.6 Performance Requirements

3.2.2.6.6.1 The DMS shall provide the capability to backup a database of up to 5 MB to local, non-volatile storage within five minutes on a workstation with active remote sessions.

Traceability: AGCCS
Priority 2

3.2.2.6.6.2 The DMS shall provide the capability to restore a database of up to 5 MB from local, non-volatile storage within five minutes on a workstation with active remote sessions.

Traceability: AGCCS
Priority 2

DA 3.2.3 Database Administration Requirements Submitted by the Army

DA 3.2.3.1 Database Administration shall provide the Officer In Charge / Non-Commissioned Officer In Charge (IOC/NCIOC) the following:

DA 3.2.3.1.1 The capability to display the following types of information:

DA 3.2.3.1.1.1 Parameters to _____, store, sort, modify, recall, and _____ mirrored databases of selected operational databases.

Traceability: ARMY, 20 July 1996
Priority ???

DA 3.2.3.1.1.2 Parameters to activate, deactivate, transfer, compare, load, store, retrieve, and dynamically modify the update frequency of local and replicated databases, and entries in databases.

Traceability: ARMY, 20 July 1996
Priority ???

DA 3.2.3.2 Database Administration shall provide the capability to create hierarchical and non-hierarchical (e.g., list-like) access control structures.

Traceability: ARMY, 20 July 1996
Priority ???

DA 3.2.3.3 Database Administration shall provide the capability to maintain hierarchical and non-hierarchical (e.g., list-like) access control structures.

Traceability: ARMY, 20 July 1996
Priority ???

DA 3.2.3.4 Database Administration shall provide the capability to generate a DBMS access audit trail.
Traceability: ARMY, 20 July 1996
Priority ???

DA 3.2.3.5 Database Administration shall provide the capability to manage multiple logical databases concurrently.
Traceability: ARMY, 20 July 1996
Priority ???

DA 3.2.3.6 Database Administration shall provide the capability for the following mirrored database management functions to an authorized Database Administrator:

- create a mirrored database
Traceability: ARMY, 20 July 1996
Priority ???

- maintain a mirrored database
Traceability: ARMY, 20 July 1996
Priority ???

- delete a mirrored database
Traceability: ARMY, 20 July 1996
Priority ???

- access a mirrored database
Traceability: ARMY, 20 July 1996
Priority ???

DA 3.2.3.7 Database Administration shall provide the capability to dynamically modify the update frequency of a mirrored database.
Traceability: ARMY, 20 July 1996
Priority ???

DA 3.2.3.8 Database Administration shall provide the capability to archive a database (5Mb) to local mass storage in five(5) minutes or less on a workstation with other active processes.
Traceability: ARMY, 20 July 1996
Priority ???

DA 3.2.3.9 Database Administration shall provide the capability to restore a database (5Mb) from local mass storage in five(5) minutes or less on a workstatoion with other active processes.
Traceability: ARMY, 20 July 1996
Priority ???

DA 3.2.4 Database Management Requirements Submitted by the Army

DA 3.2.4.1 Database Management shall provide an interface to COTS software necessary for applications to utilize the following DBMS capabilities:

- adhoc (i.e., relational, spatial, and combined) database queries
Traceability: ARMY, 20 July 1996
Priority ???

DA 3.2.4.2 Database Management shall provide the capability to support applications using Embedded SQL as follows:

- generate
Traceability: ARMY, 20 July 1996
Priority ???

- preprocess

Traceability: ARMY, 20 July 1996
Priority ???

- compile

Traceability: ARMY, 20 July 1996
Priority ???

- execute

Traceability: ARMY, 20 July 1996
Priority ???

DA 3.2.4.3 Database Management shall provide a client-server DBMS interface capable of supporting both local and remote database transactions by authorized users.

Traceability: ARMY, 20 July 1996
Priority ???

DA 3.2.4.4 Database Management shall provide the capability for authorized user applications to concurrently access multiple local and remote databases without conflict.

Traceability: ARMY, 20 July 1996
Priority ???

DA 3.2.4.5 Database Management shall provide the capability to support (add and delete) data transactions on remote heterogeneous databases by applications and utilities that communicate across HF, VHF, and UHF Combat Net Radio (CNR) networks.

Traceability: ARMY, 20 July 1996
Priority ???

DA 3.2.4.6 Database Management shall provide the capability to update a database with auto-update information if the following conditions are true:

- the auto-update information is more recent than the databased information

Traceability: ARMY, 20 July 1996
Priority ???

- the auto-update message source is an authorized proponent or the information was automatically propagated by another replicate copy of the database

Traceability: ARMY, 20 July 1996
Priority ???

- the update has a security classification equal to or lower than the local database

Traceability: ARMY, 20 July 1996
Priority ???

DA 3.2.4.7 Database Management shall provide query response times according to Table 5. DMS Query Response Times.

Traceability: ARMY, 20 July 1996
Priority ???

System Category	Routine Simple	Routine Complex	Priority Simple	Priority Complex
I	2 sec	1 min	2 sec	1 min
II	5 sec	2 min	2 sec	1 min
III	5 sec	2 min	5 sec	2 min
IV	5 sec	3 min	5 sec	3 min

V	10 sec	5 min		
VI	10 sec	5 min		

Table 5. DMS Query Response Times

DA 3.2.4.8 Database Management shall provide local data file update response times according to Table 6.
DMS Local Data File Update Response Times.

Traceability: ARMY, 20 July 1996
Priority ???

(* = beyond human factors)

System Category	Routine Simple	Routine Complex	Priority Simple	Priority Complex
I	2 sec	1 min	2 sec	1 min
I	5 sec			*
II	7 sec		5 sec	*
III	9 sec		5 sec	*
IV	12 sec		7 sec	*
V	15 sec		9 sec	
VI	15 sec			

Table 6. DMS Local Data File Update Response Times

DA 3.2.4.9 The database with SQL capability will adhere to the following performance characteristics (per 1,000 data elements averaging 12 bytes alphanumeric data) from a 1Mb DBMS:

DA 3.2.4.9.1 Data retrieval time will not exceed 30 seconds.

Traceability: ARMY, 20 July 1996
Priority ???

DA 3.2.4.9.2 File sort time will not exceed 30 seconds.

Traceability: ARMY, 20 July 1996
Priority ???

DA 3.2.4.9.3 Record update time will not exceed 25 seconds.

Traceability: ARMY, 20 July 1996
Priority ???

DA 3.2.4.9.4 File join process time will not exceed 60 seconds.

Traceability: ARMY, 20 July 1996
Priority ???

DA 3.2.4.9.5 File export process time will not exceed 45 seconds.

Traceability: ARMY, 20 July 1996
Priority ???

DA 3.2.4.9.6 File deletion and re-indexing time will not exceed 410 seconds.

Traceability: ARMY, 20 July 1996
Priority ???